Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method of determining how a region of a data structure in an application evolves, comprising:

periodically traversing only selected constant-sized subgraphs of a full graph in the region in the application in order to detect data structure changes of patterns in the subgraphs while the application is running, wherein a data structure is a subgraph of an object reference graph snapshot and the subgraph comprises nodes that own constituents;

using these data structure changes to describe, characterize, and identify changes to the region as a whole and

reporting the changes to the region to an analysis agent.

2. (Cancelled)

3. (Original) The method of claim 1 used to detect one of the following changes to a region: additions to a region; removals from a region; and internal restructuring within a region.

4. (Original) The method of claim 1 wherein the selected subgraphs to traverse are derived by

computing the region key for the constituents of the data structure; and

identifying the unique set of paths from owner proxy to change proxy as the set of traversals.

5. (Original) The method of claim 4 wherein the traversals are shortened by

identifying a subpath of the path which is unlikely to change as the region evolves; and

trimming the path to exclude the parts of the path which are unlikely to change.

6. (Original) The method of claim 1 wherein determining how a region of a data structure in an application evolves is a continuous and adaptive process.

7. (Original) The method of claim 6 wherein the process is made continuous and adaptive by

identifying a set of desired updates; and

adjusting the period in between traversals based on whether the desired updates have been witnessed.

8. (Original) The method of claim 6 wherein the process is made continuous and adaptive by

identifying a set of desired updates; and

adjusting the frequency of sampling any one traversal based on whether that traversal has detected desired updates.

9. (Original) The method of claim 6 wherein the process is made continuous and adaptive by implementing one of the following procedures based on the result of performing a traversal: adding new traversals; removing existing traversals; and modifying the path of existing traversals.

10. (Previously presented) The method of claim 1 further comprising

updating qualitative characterizations of the regions under analysis based on structural changes to the regions as a whole.

11. (Original) The method of claim 1 further comprising

updating quantitative characterizations of the regions under analysis based on structural changes to the regions as a whole.

12. (Currently amended) A computer readable medium for determining how a region of a data structure in an application evolves, comprising instructions for:

periodically traversing only selected constant-sized subgraphs of a full graph in ~~of~~ the region in the application in order to detect data structure changes in the subgraphs while the application is running, where a data structure is a subgraph of an object reference graph snapshot and the subgraph comprises nodes that own constituents;

using these structural changes to describe, characterize, and identify changes to the region as a whole; and

reporting the changes to the region to an analysis agent.

13. (Currently amended) An information processing system comprising:

a processor comprising logic for performing instructions of:

periodically traversing only selected constant-sized subgraphs of a full graph in ~~of~~ a region in the application in order to detect data structure changes in the subgraphs while the application is running, where a data structure is a subgraph of an object reference graph snapshot and the subgraph comprises nodes that own constituents;

using these structural changes to describe, characterize, and identify changes to the region as a whole; and

a memory for storing the instructions; and

an interface for reporting the changes to the region to an analysis agent.